

THE LANCET

Infectious Diseases

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed.
We post it as supplied by the authors.

Supplement to: Yelin D, Wirtheim E, Vetter P, et al. Long-term consequences of COVID-19: research needs. *Lancet Infect Dis* 2020; published online September 1. [https://doi.org/10.1016/S1473-3099\(20\)30701-5](https://doi.org/10.1016/S1473-3099(20)30701-5).

Long term consequences of COVID-19: research needs

Supplementary material

Box 1: Long-term complaints of people recovering from acute COVID-19

Extreme fatigue
Muscle weakness
Low grade fever
Inability to concentrate
Memory lapses
Changes in mood
Sleep difficulties
Headaches
Needle pains in arms and legs
Diarrhea and bouts of vomiting
Loss of taste and smell
Sore throat and difficulties to swallow
New onset of diabetes and hypertension
Skin rash
Shortness of breath
Chest pains
Palpitations

Box 2: Questions on long term consequences of COVID-19 that can be answered by research

How can we help people with long term complaints? Physical therapy? Nutrition? Medications?
How many will need intensive reconditioning? Will it help?
How many will suffer from long term sequelae? Which sequelae?
How long will they suffer?
Can we predict during the acute disease which patients will develop long term consequences?
Are there features of the acute disease which predict long term consequences? Or underlying diseases which put patients at risk?
Are there management strategies of the acute disease related to the prevention (or exacerbation) of the long term consequences?
Will the people be infected again?
What is the contribution of social distancing and long isolation?
What is the time course of the immunological response in these patients? How does it differ from the time course in patients with no sequelae? Are there immunological patterns related to specific sequelae?
Is there an infectious or inflammatory explanation to the prolonged disease?
Are some of the manifestations explained by hypercoagulability?
Is there a genetic determinant to the prolonged disease?

Box 3. Requirements and design for research

Requirements	
Multi-disciplinary approach	
Common protocol of follow-up (time-points and evaluation)	
Population and outcome definitions	
Information on underlying conditions and the acute disease characteristics	
Availability of biological samples collection	
Multi-centre and multi-national approach	
Information technology services support	
Funding	
Design of research	
Cohorts of COVID-10 convalescents seen at regular intervals during 1-2 years after the acute disease: <i>Exposures:</i> Severity and management of the acute disease, people's characteristics and underlying disorders. <i>Outcomes:</i> Long term sequelae.	
Nested case-control studies on severe long-term manifestations looking for explanatory mechanisms: <i>Cases:</i> Convalescents with a severe organ or system manifestation <i>Controls:</i> Convalescents without long term manifestations.	
Randomized controlled trials on optimal treatment for specific complaints or for prevention of individual long-term consequences Multi-arm multi-stage designs Other adaptive designs	